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SECTION OF THE HISTORY OF MEDICINE.

CONTENTS.

Section of the History of Medicine.

President — Sir D'Arcy Power, K.B.E., F.R.C.S.

Shawia Surgery.[1]

By M. W. Hilton-Simpson.

In venturing to lay this paper before the History Section of the Royal Society of Medicine I feel that I must offer some excuse for attempting to describe operations to experts when I am myself a layman in matters surgical and ignorant of even the most common technical terms which should be employed in such a paper as I have to submit. My excuse must be that in the early part of the years 1913 and 1914, while engaged in general ethnographical research and collecting ethnographical specimens for the Pitt-Rivers Museum, Oxford, among the Berbers and nomads of Eastern Algeria, I experienced the rare good fortune of making friends with six or seven native surgeons and inducing them to give me some details of their art, many of which, I think, have not yet been described, and I was able to collect a number of their instruments, photographs of which illustrate this paper, and which are, I believe, extremely rare in collections.

Finding myself, quite unexpectedly, on good terms with the surgeons, I determined to try to learn as much as possible from them, disregarding the fact that I was not properly qualified to conduct such inquiries; for, as I shall show, the surgeons as a rule are extremely reticent about their work, and I considered it possible that such an opportunity of learning their methods might not readily present itself again.

My researches led me to spend some months, accompanied by my wife, in the rugged barren massif of the Aurés, which lies about 40

[1] At a meeting of the Section, held October 15, 1919.

miles to the N.E. of Biskra, on the northern edge of the Sahara desert. We lived as the guests of the native sheikhs, in remote hamlets of stone huts, perched high among rocky crags, where the ancient Berber race has remained as little altered by the various waves of conquest which have swept over North Africa as in any part of Algeria, and we also spent some time among their pastoral nomad neighbours, so-called Arabs, who wander with their tents over the desert country to the S.W. of the Aurés massif.

It has long been known that surgery, especially the operation of the trepan, is practised by the natives of this remote district, but a careful study of their methods has hitherto been rendered impossible owing to the reticence of the surgeons themselves. The reason of this reticence is not far to seek. None of them, of course, have received any sort of training in modern surgery from French institutions, so that should a patient die the surgeon who operated upon him would be technically responsible for his death. This reason alone is sufficient to cause the native surgeons to practise their art so secretly that, even when it has been known that operations have frequently been performed in a given locality, it has been impossible for the authorities to discover who has performed them.

It was, therefore, with little hope of seeing anything of this surgery that we commenced our ethnographical work among the Shawia (Berbers) and the nomads in 1913. But, as luck would have it, however, we soon made the acquaintance of a nomad practitioner whose tent was pitched close to one of the cases in his tribal area. At first this man was very reticent, but after a time we convinced him that he had nothing to fear from us, and eventually he was persuaded to supply us with some instruments and with many of the notes contained in this paper. Later on several Berber surgeons, learning that we had already found out something of the work of their neighbours, became willing to disclose their identity, to receive us as guests in their homes, and to provide us with details of their operations and with many instruments.

I made careful inquiries of each of these surgeons as to how they had learned their art, and, although it has been suggested by Doctors Malbot and Verneau in *L'Anthropologie*, viii, 1897, that a sort of central college for the training of surgeons exists in the fastnesses of the Aurés, each and all declared that this was not the case, but that their art had been handed down to them by oral tradition, usually from father to son, for whole families appear to practise medicine and surgery both among

the Berbers and the nomads. The practice of surgery, moreover, would appear to be by no means confined to the neighbourhood of the Aurés, for the nomads informed me that operations such as that of the trepan are frequently performed at Wad Souf and Tuggurt in the Sahara, some 150 miles to the south of the mountains.

Certain of the surgeons possess books, both manuscripts and reprints of Arabic books obtained from Tunis, but they state that they place far less faith in the instructions contained in them than in the training they received from their fathers, and in some instances men who can perform successfully the operation of the trepan, and who

FIG. 1.

Bleeding by Shawia surgeon, without the aid of a cup.

claim to graft bone in limbs, are quite unable to read any Arabic or any other language. I think that when I renew my researches on the spot I shall find that the books relate rather to medicine than to surgery.

As a rule the surgeon, whether Berber or Arab, visits his patients in their own homes. We could not expect to find anything resembling a hospital among the tent-dwelling nomad Arabs, but in one case I did see a primitive hospital in a remote Shawia (Berber) hamlet. A family

of five brothers all practised surgery in this tiny village, where they had set aside a small, dark, unfurnished stone hut for the reception of patients who were brought to them from a distance. When I saw it, this low-pitched building, which could not have measured more than 18 ft. long by about 12 ft. wide, contained a man waiting to be trepanned, and who was being nursed by his wife, together with a small girl suffering from an excrescence on the lip, and her mother and a man from whose tibia some bone had been removed. The patients brought their own food, cooking utensils, rugs, &c., nothing but the bare room being provided by the surgeons.

My wife and I slept in the hut next door to this place of torment, the groans proceeding from which supplied us with ample evidence of the discomfort which reigned there. This was the only instance I have yet met with of any special building being set aside for the treatment of the sick.

The instruments used by the surgeons are very primitive. They are locally made by blacksmiths or by the manufacturers of the more or less neatly made silver pendants, necklaces and earrings with which all the native women, however poor, adorn themselves. The reason that such instruments are extremely rare in collections is rather the fear that the surgeon may be discovered by the authorities should he part with his instruments to strangers than any regard he may have for the instruments themselves.

In attempting to estimate the success or failure of the surgeons as a whole, we have very little evidence to go upon. Numerous living patients can be found who have been successfully trepanned or who have undergone other operations, and the surgeons delight in describing their many triumphs, but the other side of the picture is hidden from us by a veil of fanatical Mohammedanism: Allah willed that the patient should die, and so he died; his death was in no way due to a mistake on the part of the surgeon. To the layman it seems remarkable that any of their operations should prove successful, for they appear to lack the most rudimentary knowledge of surgical cleanliness. When questioned as to how they cleaned their instruments, they replied that they washed them in water, either warm or cold, whichever was at hand, and no attempt at cleanliness seems to be made with regard to the wool used as pads, or the rags, usually strips of an old garment, which serve as bandages. I have, however, the evidence of my own eyes that in many cases they do successfully perform operations which, with the instruments at their disposal, must be both difficult and dangerous.

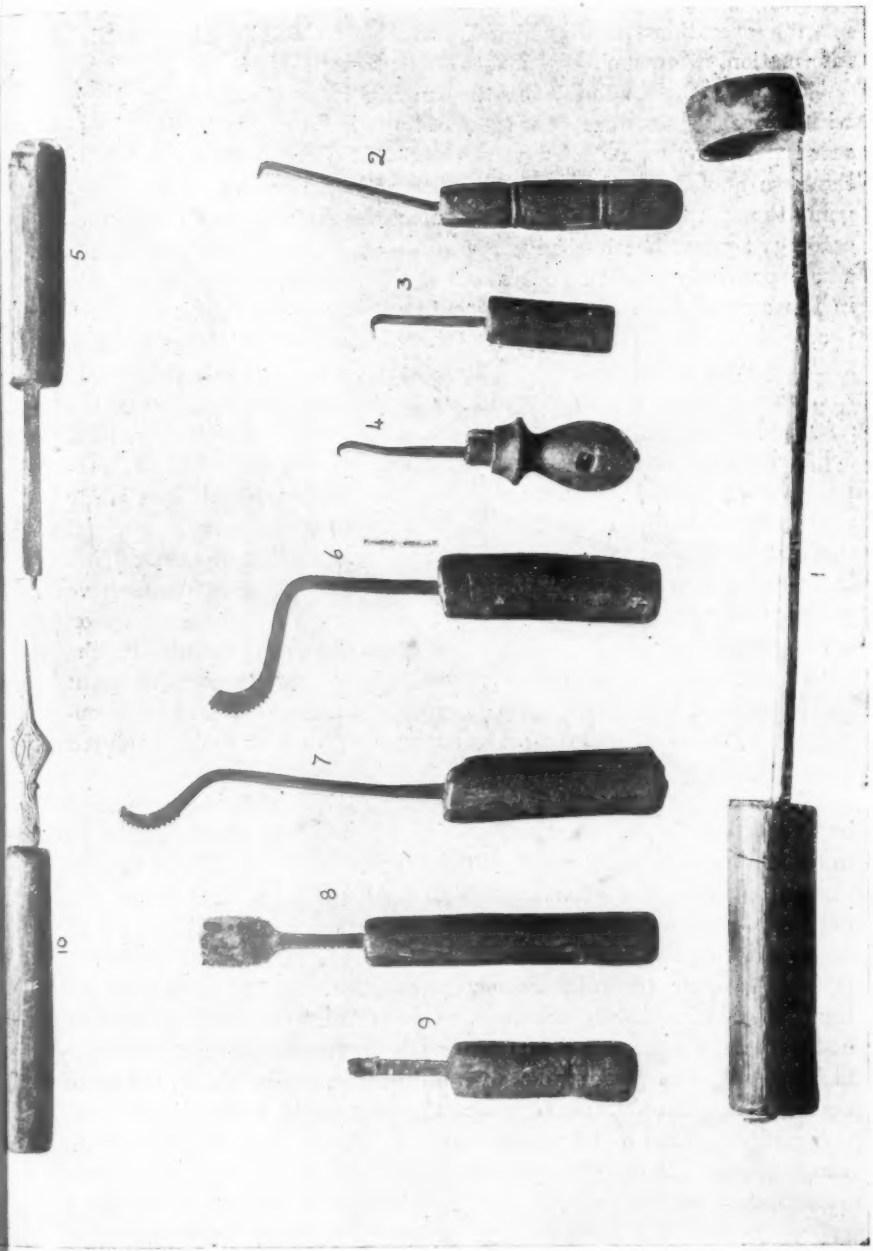

FIG. 2.
Trephining instruments of Shawia surgeons.
(This and the two following illustrations (figs. 3, 4) are reproduced by permission of the Council of the Royal Anthropological Institute.)

I will attempt to describe, much as the natives described them to me, the operations as to which I was able to obtain fairly detailed information, commencing with that of the trepan.

There can be no doubt that trepanning is practised in the Aurés with frequency; the number of cases of living persons bearing the trepan scar reported by various observers is sufficient proof of this, but despite the case quoted by French authors of a woman unnecessarily undergoing the operation in order to manufacture evidence in divorce proceedings against her husband, my Arab and Berber surgeon friends assert positively that the operation of the trepan is resorted to only in the case of injuries caused by a blow. Among a quick-tempered people living in a stony country such cases are certain to be common.

The scalp immediately over the seat of the injury is completely removed, and not merely turned back to facilitate the operation on the skull. This is carried out by removing the skin with a red-hot cylindrical scalper (fig. 2, 1 and fig. 5, 16) closely resembling a gun-maker's wad-punch, but which some surgeons declare should be slightly oval in form, or by cutting away the skin with a cold knife. One of the instruments collected (fig. 5, 17) is a combination of the scalping knife and the trepanning saw, but this is the only example I have yet seen of any special knife being used in surgery with the exception of European lancets, which are very acceptable presents to the native surgeons. The ordinary sheath knife with a rounded point to its blade of about $7\frac{1}{2}$ in. in length, such as is carried by all up-country Algerian natives for general purposes, appears to be employed in surgery.

When scalping with the knife a rectangular piece of skin is removed by four straight cuts. Should the injury to the skull thus revealed be in the nature of a crack or slit, all that the surgeon has to do is to trim the edges where the bone appears to be "bad," but in the case of a punctured wound a considerable amount of bone may have to be removed owing to the cracks which radiate from the central puncture. Opinions appear to differ among the surgeons I questioned as to the best method of removing the bone. One of them informed me that he had successfully accomplished the task by means of contiguous or nearly contiguous perforations with a drill in cases in which, for some reason which he did not explain, the saw could not well be used, the drill he employs having a round point about $\frac{3}{16}$ in. in length, which is prevented from perforating too deeply by means of two "shoulders" on the blade (fig. 2, 5). This man states that he does not

use a trident drill such as has been described by Doctors Malbot and Verneau, and that such a drill is in no way superior to his own. I have, however, collected from another surgeon a piece of bone removed from a skull which bears evident signs of a small trident drill having been employed upon it, presumably as a starting place for the saw, since it has not pierced the skull (fig. 3, 12×). The drill is used by spinning it between the palms of the hands.

FIG. 3.

Fragments of bone removed by native surgeons.

I have not yet been able to find a surgeon who uses the drill described by Malbot and Verneau, the handle of which is divided into two parts, the blade and lower end of the handle being loosely socketed into the remainder of the handle, so that the blade can be spun while the surgeon keeps pressure on the instrument by leaning his forehead upon the upper portion of the handle, but one of my native friends has seen such a drill.

The drill is used also by some surgeons either to provide an outlet for any pus or blood which might be under the skull, or simply to form a starting point for the saw, in which latter case the skull is not

pierced through; other surgeons, however, have told me that a drill should never be used on the skull as its use is most dangerous, doubtless owing to the risk of disturbing the dura mater by too deep penetration by the somewhat heavy pressure of the drill, for all the natives agreed that the dura mater must on no account be disturbed, as death would ensue should this be done. The saw, whether or not the drill has been used to form a starting point for it, is applied to the "good" bone just clear of the "bad" bone that is to be removed. It is usually guided and

FIG. 4.

Tooth forceps, cupping instrument, and amulet.

steadied against the nail of the surgeon's left thumb, which is held vertically upon the patient's head.

All the trepanning saws I collected are so made that they can be used in this position, and are also so shaped that pressure can be applied to them either directly above the serrated edge, or very near to it, by the forefinger of the surgeon's right hand (fig. 2, 6-8, and fig. 5,

17-21). The piece of bone to be removed is sawn round, but the length of time required for this part of the operation varies considerably. One surgeon told me that, in order to minimize the strain on his patient, he makes only a first incision with the saw on the day on which he removes the scalp, and continues the operation by sawing a very little more each day until the bone to be removed is completely sawn round, so little being done at a time that from fifteen to twenty days are sometimes required to remove a piece as large as a penny. The other surgeons whom I questioned, however, were in the habit of completing the work of the saw when once it had been begun.

The piece of bone that has been sawn round is carefully removed with the aid of elevators, retractors and hooks (fig. 2, 2-4 and 9; fig. 5, 23-25), but opinions differ as to when this should be done. One surgeon will remove it immediately the sawing has been done; another leaves it where it was for three days in order, as he expressed it, to give the "nerves" in the bone time to withdraw, which they will do on the third day on finding the bone to be dead; while a third leaves it for from ten to fifteen days, at the end of which time it will be found to have risen of its own accord, so that it can easily be lifted out, the scalp meantime being prevented from closing over the injured part by means of a wad of cotton soaked in honey and butter, this being the only dressing which, in the opinion of this surgeon, will not injure the dura mater if it should come into contact with it.

The surgeon, whose custom it is to remove the bone immediately after sawing, at once applies a dressing of gum of the Aleppo pine melted with butter six months or one year old (sheep's butter is said to be the best for medical purposes) upon which, when applied, he allows a few drops of honey to fall, and over which he then sprinkles a little of the finest wheat or barley flour. A pad of wadding is laid upon the dressing, being held down by a small rectangular leaden weight rather larger than the aperture made in the skull; this weight has a small boss in the centre of its upper side through which is passed a thread for raising it (fig. 5, 28). The object of the weight is to counteract a tendency on the part of the brain to rise up through the aperture.

The above dressing is renewed once daily. At the end of seven days the dura mater will have become "steady" except for the pulse-like movement which is permanently noticeable after the scalp has re-formed over it, and it will appear red all over the visible surface instead of white with red veins in it as it appears when first exposed. The daily dressing is continued for fourteen days, after which it is

renewed every other day for a month or five weeks, apparently as an inducement to the scalp to close over the wound, for no stitches are put in the scalp for this purpose. The operation is then complete, and all my surgeon friends agree that no ill effects result from it.

In ordinary circumstances no artificial plate of any kind is used to replace the bone removed, though an Arab surgeon told me that one of his ancestors had removed nearly the whole of the crown of a man's head and replaced it by a cap of plaited halfa grass, the patient living for a year afterwards and subsequently dying from some different

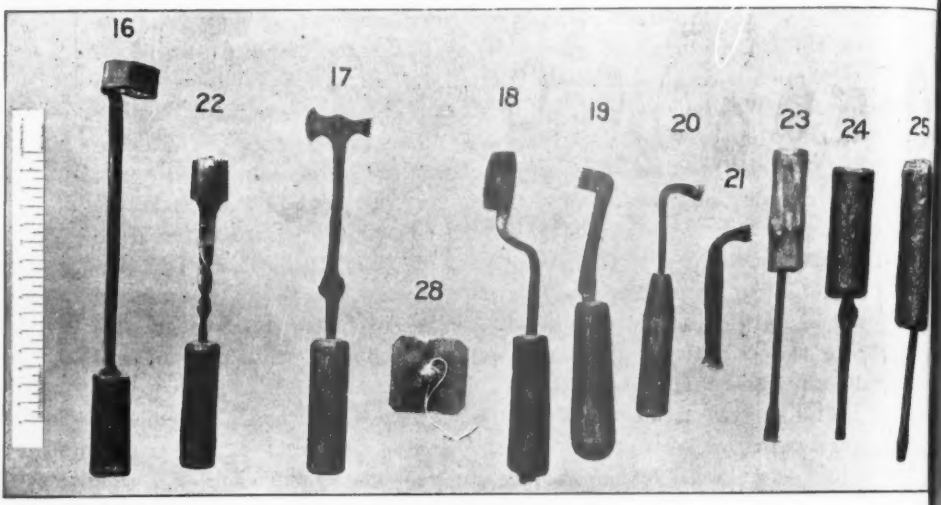

Fig. 5.

Instruments used in trephining.

cause; while it is rumoured among the Shawia that one of their surgeons performed a similar operation, using camel's skin as a covering, the patient surviving for ten years. None of the surgeons I met with, however, had ever attempted to replace the bone removed by any form of plate, and none claimed to have performed himself any such operation as the two mentioned above, though one of them, who claims to trepan as many as five heads in a single year, told me that he had "often" removed a piece of skull 2¼ in. in diameter. This surgeon showed me one of his patients in 1913, a boy, who was undergoing a protracted operation for the removal of damaged

bone from his skull (I described his case in the *Journal of the Royal Anthropological Institute*, 1913, vol. xliii), and in 1914 I saw this boy, in apparently perfect health, and collected the bone which had been removed. I have seen other cases of similar operations which had been performed by this tent-dwelling, illiterate Arab surgeon.

No anæsthetic whatever is used by any of the surgeons I consulted. They all declare that, owing to the extreme delicacy of touch with which they claim to perform their operations, anæsthetics are unnecessary, and that the patient suffers very little, if any, pain. The pressure of damaged bone upon the dura mater causes pain and may produce

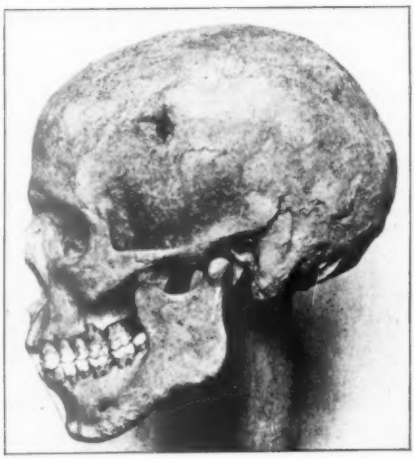

Fig. 6.

Trephined skull.

unconsciousness, the patient recovering consciousness as soon as this pressure is relieved by the operation, when the pain also ceases in the same way, according to one surgeon, as the pain caused by a thorn in the flesh ceases as soon as the thorn has been extracted. Patients do not lose consciousness during the operation. As an example of the delicacy of touch required in a first-rate surgeon, I was told that such a man could saw through an eggshell without damaging the inner skin. All my surgeon friends declare that the instruments I have collected are all that are necessary to perform the operation of the trepan, but I have no doubt whatever that there are varieties of each type of instru-

ment, probably made to suit the taste of individual practitioners, which I have not yet seen but some of which I hope to find when I renew my work in the Aurés.

It will be noticed that I collected, and now illustrate, a rough form of circular trephine to which I have not yet alluded in this paper (fig. 5, 22). I distrust this instrument. It appears to me that, owing to the fact that the central pin projects below the serrated edge and is immovable it would be unlikely to be used by anyone with such a dread of touching the dura mater as the Algerian surgeons have; furthermore, the instrument appears never to have been used and the surgeon who gave it to me evidently did not value it at all; besides which an English circular trephine, which I took out with me in the hope of obtaining something interesting in exchange for it, failed to tempt the natives, fond though they are of lancets, scissors, probes, needles, &c., of European make. I think it more than likely that the instrument was made in imitation of a European trephine but, when finished, was found unsatisfactory owing to the immobility of the pin, and accordingly discarded as useless. Concerning the skull, apparently trepanned, which I illustrate with this paper (fig. 6), I have, unfortunately, no information to offer beyond that given to me by the French road surveyor who found it. His note upon it reads as follows: "Skull found with all the rest of its bones, facing north, without any trace of monument whatever, in a cutting made on the remains of an old Roman post 253 kilometres from Stora and 12 kilometres from El Kantara, in November, 1913." This site lies on the main road running south to Biskra, but I have not yet had an opportunity of visiting it.

Bone is frequently removed from limbs, although the natives have the greatest horror of amputation on religious grounds. The most common cause for operations of this nature is the terrible wound inflicted by muzzle-loading firearms loaded with any sort of missile that may be handy, stones, slugs of any shape, &c.

I have described elsewhere[1] the case of a nomad sheikh who had had bone successfully removed from his left arm by one of the surgeons I met in 1913, and I collected a fragment of a woman's tibia which had been removed by the same man (fig. 3, 11). In 1914 I came across some more cases of a similar nature. One of them was a man who had been shot in the right shin about four months before. The native surgeon

[1] *Anthropological Journal*, xliii.

who was attending him told me that the man had been taken to a French medical officer, who had declared amputation to be necessary; sooner than lose his limb, however, the patient returned to his mountain home for treatment. The Shawia surgeon removed considerable quantities of bone from the limb, feeling for the seat of the injury with a fine spoon-shaped probe (fig. 8, 30), and cutting away the bone with a limb saw, which I collected (fig. 8, 36), or with one of his trepanning saws. The leg was then put into splints similar to those I illustrate (fig. 9)

FIG. 7.

Portions of bone removed by native surgeons.

and dressed daily by the surgeon. When I saw the case the wound had nearly healed, and the dressing was made by the surgeon spitting into a pot and adding a little olive oil to the saliva, which was then smeared on the injury, some powdered leaves of arar (*Juniperus phoenicea*) being subsequently sprinkled on to it. The surgeon told me that the patient must avoid colds and must not stand up (he did so in my presence to show that it was possible) in order that the blood might not flow too

freely into the wound. The leg was much swollen, but the swelling was to be reduced by some treatment which was not described to me, though the patient will always be lame. The case was being treated in the "hospital" which I have described. The use of saliva in the dressing may have a magical origin, arising out of the idea that the surgeon is possessed of some supernatural power, analogous perhaps to the belief that the breath of a man reading the Koran can be used to counteract the effects of the "evil eye," the reader pausing every now and then to breathe upon his palm, with which he gently rubs the

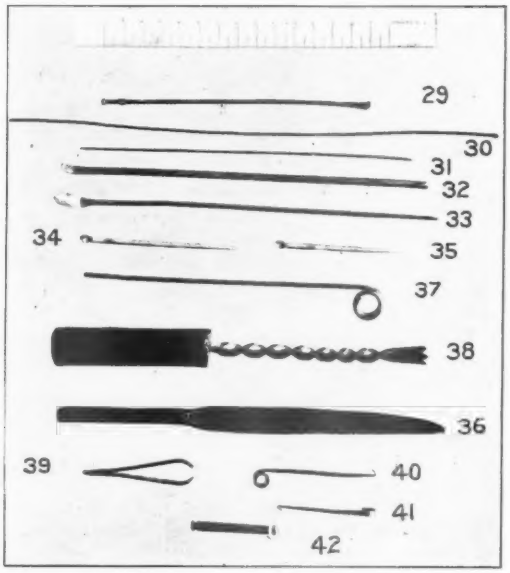

FIG. 8.

Probes, bone drill, drill, tweezers, and ophthalmic instruments used by native surgeons.

victim of the admiring glance. With the exception of the limb saw and probe already alluded to and a pair of tweezers (fig. 8, 39), usually of European manufacture, with which to remove fragments of shattered bone, no instruments other than those used for trepanning appear to be required for the removal of bone from a limb, although in cases where only a small part of the bone is injured or diseased the "bad" bone is

removed by one of the surgeons I met with by means of a coarse trident drill, of which I collected a specimen (fig. 8, 38).

The necessary incision before the operation is commenced is made with a knife, used either hot or cold; one surgeon informed me that he uses the cold knife if the patient does not object to losing blood. Only one of the surgeons I met with told me that he had successfully attempted the grafting of bone in a limb, but this man stated that the operation is not uncommon. He told me that it could only be performed upon a bone which is well surrounded by flesh, and not, for

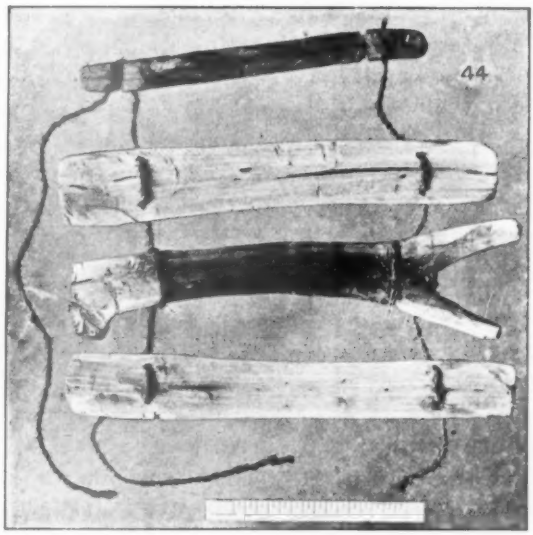

FIG. 9.

Splints for fractured leg.

example, in the tibia or the jaw, because no attempt is made to join artificially the new bone to the old, but it is simply held in place by the surrounding tissues supported by bandages.

The bone used is that of a dog of the ordinary Algerian breed about the size of a small collie, the dog being killed when required so that the bone is fresh. The surgeon carefully measures the length of the piece to be grafted and also trims it to a proper shape at the ends so that it will fit as firmly as possible into its place. The time necessary to

complete a cure by this means varies according to the age of the patient, in the case of an elderly man from two months to two months and a half being needed. The same surgeon who gave me the foregoing information told me that he had heard of the grafting of skin by native practitioners but had never attempted it himself. It is, perhaps, worth recording that this man was unable to read Arabic or any other language and that he has learned his art from his father.

In 1914 I heard of a native mounted policeman who suffered an injury when a child, as a remedy for which some bone from the leg of a sheep had been grafted into his leg by his father and who was said to have grown up into a perfectly fit man, but I learned of the case only from one of his comrades and I have never seen the man himself.

A simple fracture of the tibia is treated as follows: The bone is set, and butter without any salt in it is smeared over the seat of the injury, wheat flour being subsequently sprinkled over it and the limb wrapped up in a cloth. Four splints are then applied to the back, front and sides of the limb and, by one surgeon at least, the foot is bound rigidly in a natural position to a piece of wood which is fixed against the wall in the case of a house-dwelling patient or driven into the ground in the case of an inhabitant of a tent. If the foot becomes swollen the fracture is regarded as knitting satisfactorily; if, however, the limb swells above the seat of the injury the cure is not proceeding well. One surgeon gave me a set of specially constructed splints of hard wood joined together with cords and slightly curved in shape to fit the limb, the splint intended for use at the back of the leg terminating in a fork to hold the heel (fig. 9, 44). Other practitioners, however, appear to use any straight pieces of wood, such as the strips of a box lid illustrated which were used to show me the method of their employment. In the case of fracture caused by a gunshot wound holes are made in the splints directly over the entrance and exit holes of the bullet in order to admit of the application of dressings without disturbing the limb that has been set. It is curious that the same surgeon who insisted upon the absence of salt from the butter applied to a fractured leg should have told me that some salt in a coffee cup full of wheat flour and eggs (up to the number of seven) tends to cause a fractured rib to knit. Salt, it may be noted, is largely used in magical operations directed against the jenoun or demons so dreaded by all Algerian natives.

In the opinion of one of the surgeons I met with muscles do not break, but a fall, or some similar accident, is liable to cause displacement

of flesh. A hot bath followed by massage is the best treatment for this, and is easily obtainable in any village that boasts a bath house, for the bath attendants are accustomed to massage their patrons, but should massage be impossible, cautery is resorted to.

In the case of twisted joints a red-hot pointed instrument is applied all around the seat of the injury in light quick stabs, but should any great amount of fluid have formed it is drawn off by means of an incision with a knife. The cautery is very extensively used in Algeria, and the instruments employed vary in shape (fig. 11, 45-52), some consisting of a flat rectangular blade, others of a pointed rod turned to form a right-angle at the distal end, while others again

FIG. 10.

Native surgeon applying splints in case of fractured tibia.

closely resemble in outline the sickle hook which, with plain or serrated edge, is to be found in every Algerian house or tent (fig. 11, 46 and 48). This resemblance to the sickle may very possibly indicate the origin of this particular form of cautery instrument, for I find in General Daumas' "Horses of the Sahara" a reference to the use of the heated sickle itself for the "firing" of horses. The sickle-shaped instruments are intended for the removal of bad flesh from suppurating wounds and sores, but their points can also be used for applying cautery

to joints in the manner described above. The cautery is largely employed for splenic troubles and is frequently applied by laymen and even by the patients themselves; I have seen the dots made by the cautery on the side of a woman who had applied it to herself, while one of the camel drivers whom I employed a dozen years ago far down in the Sahara had cauterized his own knee using his sheath knife for the purpose. The short wooden spikes used in the manufacture of halfa grass sandals are sometimes heated and used to apply mild cautery to small children for splenic troubles, a method which recalls the

Fig. 11.

Cauteries used by Shawia surgeons.

application of hot oil to the side by means of a boxwood spindle for diseases of the liver referred to by Hippocrates, while for rheumatism the nomads heat the root of "driess" (*Thapsia garganica*) and apply it after the manner of the cautery instrument.

In 1914 I witnessed the application of the cautery in conjunction with the insertion of a seton. I accompanied the surgeon and his two assistants, who called at a silversmith's house on the way to procure a new cautery instrument which had just been manufactured (fig. 11, 51). The patient was lying upon a "tellis," or sack used to carry grain, &c.,

on mule back, in his own house. He was fat and apoplectic in appearance. An oil lamp of European make was lighted and some acetate of copper, which had been powdered in a mortar, was mixed with three coffee-spoonfuls of honey and a very little water and heated over the flame; three strips of old and dirty red rag, provided by the patient's wife, were then steeped in the mixture to form the setons. One of the surgeon's assistants then supported the head of the patient who lay upon his back while the other, with the forefinger and thumb of each hand, pinched up a ridge of flesh about two-thirds of an inch in height horizontally across the body about an inch above the navel, beside which was placed a flat strip of copper on the side farthest from the navel. The surgeon then took a probe (fig. 12, 54, 55, 56) which had

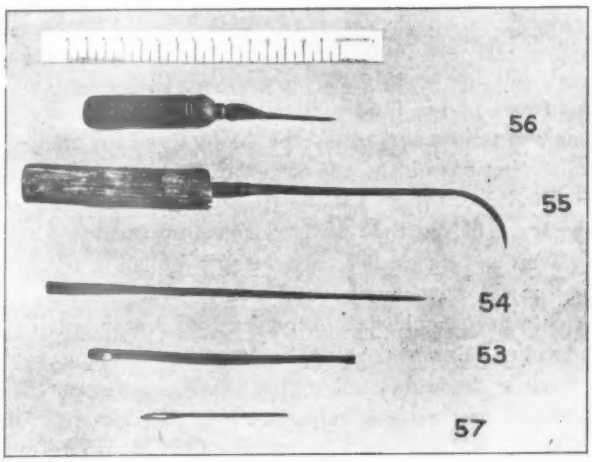

FIG. 12.

Probes and setons used in application of cautery.

been made red-hot over the lamp and thrust it through the ridge of flesh in the centre directly above the navel, making the perforation from the upper side, where the strip of copper prevented the red-hot instrument from coming into contact with the skin beside the ridge. One of the setons steeped in the dressing already described was then introduced by means of a copper needle (fig. 12, 57). A second seton was introduced beside the first, $1\frac{1}{2}$ in. or 2 in. distant from it, in exactly the same manner and the probe was then introduced on the other side of the first one at an equal distance from it.

While this part of the operation was being performed the patient behaved with remarkable fortitude although no anæsthetic had been administered to him; he evinced no sign of suffering whatever, but he was quite conscious and even inquired if I was comfortably seated upon the box which had been provided for me while the surgeon was threading the last seton upon his needle. The setons having been inserted some cold pitch of *Juniperus phoenicea* was smeared around them and upon the skin of the abdomen, after which a copper instrument with a rectangular blade (fig. 11, 51) heated over the lamp, was vertically applied in quick light stabs all over the abdomen and around the navel and the setons. Powdered henna, which had been prepared in a brass mortar, was then sprinkled freely over the surface just cauterized and the part affected was covered with an old piece of a woman's dress and bound up. The final application of the cautery evidently caused considerable pain, for this time the patient writhed and groaned, but he quickly recovered his equanimity sufficiently to laugh and to call to his family, who had been in another room during the operation, to prepare coffee for the doctors and for me.

Although affections of the eye are extremely common in all parts of the Sahara, the best surgeon I met with among the nomad inhabitants of that country told me that he performed no operation for cataract and he appeared to be aware of only a magical form of treatment for it. Among the Shawia, however, I found a surgeon who claimed to be able to remove cataract should it not respond to treatment. Before the cataract is ready for removal he applies to the eye some powder made as follows: Some fluid obtained by pounding in a mortar the leaves of *Lycium Europaeum* (in the Shawia dialect "haderamith") is placed in an empty eggshell and the hole in the shell closed up with dough. The shell is then placed in the midst of a dish of kuskus (the porridge-like national dish of Algeria) and cooked, being left in the kuskus all night. Next morning the fluid will be found to have solidified in the form of a pill which is dried in the sun, powdered, and applied to the eye upon a small stick, presumably in the same manner in which "kohl" (antimony) is applied to the eyelids of Shawia women. When ready for the operation the cataract is lifted by means of a small and very sharp pointed hook (fig. 8, 40, 41) and is "skinned" away towards the nose corner with a French scalpel. At the nose corner it is removed with a pair of French scissors. Should a drop of blood exude as a result of the use of the scissors some oil, to which salt has been added, is applied on wool. Some powder consisting of equal parts

of saltpetre, alum, saffron and eggshell, passed through a cotton rag to render it as fine as possible, is then applied to the eye and a bandage put on. A cure is effected in about eight or ten days after the cataract has been removed.

The same surgeon told me that cataract can be cured without an operation in the following manner: The film over the eye is scratched a little with a French scalpel and some very fine powder consisting of ostrich egg-shell, pearls, coral and the baked body of a scorpion, in exactly equal proportions, is sprinkled on to it. This treatment is continued until the film becomes black, after which the daily application for about a month of a lotion consisting of saffron powder and rosewater (cold in summer and warmed a little in winter) will cause the film to disappear. My surgeon friend informed me that this form of treatment is very expensive, but it is noteworthy that all the ingredients of the powder used are obtainable either from the coast of Barbary or the Sahara, and need not have been introduced into the country by foreign trade.

The disfigurement of a drooping eyelid is remedied by the same practitioner in one of two ways. The eyelid is drawn forward by means of two hooks, as used in the removal of cataract, inserted one at each end of the eyelid, the sharp point of each hook piercing the skin twice and protruding from it, and a little strip of skin is then cut away with scissors, the edges of the horizontal slit thus made being sewn together with silk, a fine French needle being used for the purpose. A little ordinary "kohl" (antimony) is used as a daily dressing. The other method of shortening the eyelid consists in drawing it forward with the hooks as before and then stitching a horizontal "reef" in it with silk or horsehair. A small flat piece of wood or cane (fig. 8, 42), split almost through the whole of its length, is then applied, the "reef" in the eyelid being introduced into the slit in the cane, which is clamped tightly on to the skin by tying the open end of the slit together with cotton. "Kohl" is applied daily as a dressing for four days. On the eighth day the small stick will fall away of its own accord and the eyelid will be found to have been shortened. The stitches are left in place until they come away automatically. Care is taken in stitching the "reef" to ensure that the eyelid, when healed, should be shortened to the correct degree, this being determined by causing the patient to open and close the eye after the lid has been taken up by the hooks.

It does not seem that stitches are very generally used in Algerian

surgery except in wounds in the face, when a needle is used to make way for the horsehair which is subsequently thrust through the holes so made, and each stitch is tied separately. Formerly silver needles were in use, but nowadays needles of European make are so easy to obtain that they have nearly superseded the locally made instruments. A mixture of honey and butter is the most used dressing for wounds, and is introduced into deep wounds, such as those from which bullets have been removed, by means of a syringe of European manufacture. I have not yet been able to find a native made instrument of this kind.

In some cases, such as clean cuts with a sword, a paste made by boiling linseed in milk and leaving it to cool is applied over the honey and butter and renewed daily until the wound is healed, or in the case of suppurating wounds, a powdered plant of "harmel" (*Peganum harmalum*) is sprinkled on the honey and butter, for it is said to "draw out the bad flesh." The leaves of *Erodium botrys*, L., known to the Arabs as "mother of the wound" are dried, powdered and made into a dressing with a very little oil or butter, the oil used being presumably that of the olive. The berries of "arar," (*Juniperus phoenicea*, L.) whose pitch is so extensively used in Shawia medicine, are pounded into pulp in a mortar and mixed with honey in the proportion of three parts pulp to one part honey, and, with the addition of half a tablespoonful of arar pitch, used upon wadding as a dressing for wounds. Dusting powders are made of the dried leaves of the oleander or of "teselgha" (*Globularia alypum*), while a mixture of the powdered leaves of "tarfa" (*Tamarix gallica*) and alum in equal proportions is used for the same purpose. For abscesses which have been opened by the surgeon powdered flint is considered to be a good dusting powder, the opening of the abscess being performed by means of a flat strip of brass heated over a fire (fig. 12, 53).

As I have been asked by one of the best surgeons I met whether I could give him anything from my medicine chest to stop hæmorrhage, it is possible that the natives themselves are ill supplied with material suitable for this purpose. In addition to the application of the ashes of rag or paper, the most common means of stopping hæmorrhage, I found that "toutia" (sulphate of copper) is rubbed lightly on the wound and is said to check the hæmorrhage by causing the tissues to swell; this, however, must be sparingly used; hot olive oil, applied with a rag, or the pounded leaves of *Solanum nigrum* bound upon the wound are also employed for this purpose. I was told that the tourniquet is never used by one of the most experienced practitioners I met with.

The natives boast that their patients never lose consciousness under an operation owing, they say, to the extreme gentleness of their methods; cases of fainting arising from some other cause are treated by throwing cold water upon the patient's face or holding an onion under his nose. Two simple operations which from ancient times have usually been performed by barbers are also performed by Arab and Shawia surgeons, namely, the extraction of the teeth and cupping. Teeth are extracted with locally made forceps (figs. 4, 14 and 13, 58 and 59), or, when very firmly rooted, by means of a fine but strong hook which is inserted behind them (fig. 13, 60). One surgeon has attempted to fill hollow teeth with opium to relieve toothache and has used a drill for the purpose,

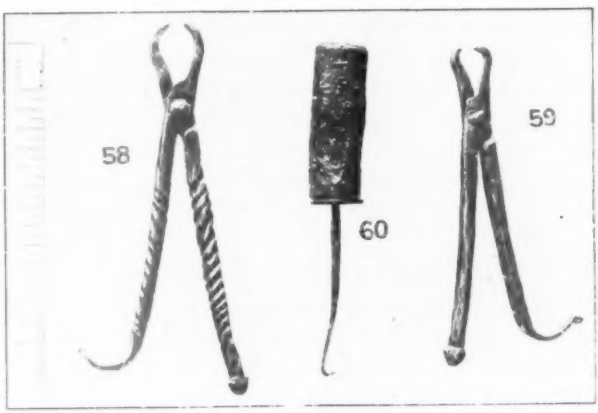

FIG. 13.

Dental forceps and hook for extracting dental roots.

but he does not find the treatment satisfactory, and he appeared to be ignorant of the cause of toothache; a layman, however, told me that the pain is caused by an insect which can be killed by filling the hollow tooth with a mixture of lime and pitch. Cupping is done with a locally made tin cup (fig. 4, 15) to which is attached a spout for causing a vacuum by suction by the mouth of the operator when the cup has been placed in position at the back of the patient's neck and the necessary incisions with a scalpel have been made, the spout being closed with rag when the flow of blood has been started. The maximum number of incisions on each side of the neck is six.

I have seen a surgeon perform this operation without the aid of the tin cup (fig. 1). He tied a handkerchief tightly round the patient's neck and made him incline his head. He then made an incision over the left eye causing a stream of blood to spurt out. When about two-thirds of a pint had been drawn off, leaving the patient pale and shaking, the handkerchief was removed and the flow of blood, which was reduced to a trickle, was stopped by the application of a little earth picked up from the ground. The surgeon rubbed the palms of his hands sharply together and pressed them firmly for a few seconds upon the patient's head, one hand over the incision and the other at the back of the head. Dry goat's dung is said to be a good substance with which to stop the flow of blood, the use of earth in this instance being explained by the surgeon who told me that as we are sprung from the earth, the earth can do us no harm and must, in fact, be good for us.

While cupping is in progress the patient often eats a lemon or drinks coffee without sugar in order to keep away a feeling of faintness which the operation produces. Cupping is very frequently practised, especially in the spring of the year when the natives are in the habit of drinking large quantities of butter-milk which, they say, causes headache and dizziness.

I hope that the foregoing notes may have given my readers some idea of the state of the surgery practised by the Shawia Berbers and their nomad neighbours in the years 1913 and 1914. I have made no attempt to trace the origin of this surgery, for having given up my work almost immediately after my return from Algeria in 1914, I am only now resuming it after an interval of five years, and I have accordingly been unable to study the subject of its origin in libraries at home. I think, however, that we are likely to find that it is traceable to mediaeval Arab and so to Greek surgery rather than to any surgery which has existed in isolation in the Aurés from time immemorial down to the present day. For a most cursory glance at an edition of Abulcasis has shown illustrations of cautery instruments resembling the circular scalpers I have collected and also of a dental extracting hook like the one illustrated in this paper, while a drill with shoulders such as I brought home is mentioned in the text, as is the method of spinning the drill between the palms of the hands. Moreover a drawing of a drill in the same edition represents the handle by a zigzag line which may, perhaps, imply that the metal part of the drill was twisted to form a spiral as it is in the specimen of a trident drill which I collected (fig. 8, 38).

I hope by the time these lines are printed to be once more among my Berber and Arab friends and to make the acquaintance of some more of their surgeons, from whom I may obtain further information as to their medicine and surgery which will throw more light upon the origin of their art and also, perhaps, provide pharmacologists at home with some new materia medica with which to experiment.

In conclusion I desire to express my thanks to the Council of the Royal Anthropological Institute for their courtesy in allowing me to reproduce three plates which illustrate my paper on "Some Arab and Shawia Remedies and Notes on the Trepanning of the Skull in Algeria" in their Journal, vol. xliii, 1913, and to Mr. Henry Balfour, Curator of the Pitt-Rivers Museum, Oxford, for providing me with the photographs of the instruments, &c., collected in 1914, which illustrate this paper.

The following list gives a detailed description of each of the instruments figured in the illustrations of this paper :—

(1) *Scalper.*—A cylinder of iron about $\frac{1}{16}$ in. in depth and $1\frac{3}{8}$ in. in diameter, made of a flat strip of iron with one sharp edge, bent round so that the ends touch without being joined. Where the ends meet one end is joined by fusion on its blunt edge to a round bar of iron about 13 in. long, so that the cylinder is at right angles to the bar. The other end of the bar passes through a round wooden handle, 4 in. in length, and is bent at right angles to prevent this handle from slipping off. The instrument roughly resembles a large "wad-punch."

(2) *Retractor.*—An iron blade projecting about $2\frac{1}{2}$ in. from a round wooden handle $3\frac{1}{8}$ in. in length. The blade where it joins the handle is rectangular in section and about $\frac{1}{8}$ in. wide, but it gradually becomes flatter and wider until at the distal end it is about $\frac{3}{8}$ in. wide, the end being slightly rounded at the corners and presenting a fairly sharp edge. This end is bent over at right angles to the rest of the blade to form a hook. The whole blade slopes slightly backwards from the handle.

(3) *Retractor.*—An iron blade projecting about $1\frac{3}{4}$ in. from a round wooden handle $1\frac{5}{8}$ in. long. For $1\frac{1}{8}$ in. of its length the blade is rectangular in section and about $\frac{1}{8}$ in. wide, but the distal end is flat widening abruptly to a width of $\frac{3}{8}$ in., and is bent round at right angles forming a hook, the fairly sharp edge of which is slightly rounded at the corners.

(4) *Hook or Retractor.*—An iron blade $1\frac{15}{16}$ in. long inserted in a lathe-turned wooden handle presumably of European origin. Where it joins the handle the blade is rectangular in section and about $\frac{1}{4}$ in. wide, but it narrows towards the distal end which is little more than $\frac{1}{16}$ in. in width. The distal end is bent sharply round to form a small hook.

(5) *Drill*, also used as an *elevator*.—An iron blade about $2\frac{3}{4}$ in. long projecting from a round wooden handle $3\frac{1}{4}$ in. in length. Where it joins the handle the blade is $\frac{1}{4}$ in. wide, and it gradually increases to a width of $\frac{3}{8}$ in. near the distal end. It narrows abruptly (leaving a "shoulder" on each side) at the distal end, so that the last $\frac{3}{16}$ in. of the blade is only $\frac{1}{8}$ in. wide. This end is rounded and has a cutting edge. The "shoulders" act as a safeguard against excessive penetration when the instrument is used as a drill.

(6) *Saw*.—An iron blade projecting $3\frac{7}{8}$ in. from a round wooden handle $2\frac{7}{8}$ in. long. The blade is rectangular in section where it joins the handle and is about $\frac{1}{8}$ in. wide. It curves downwards almost at right angles 2 in. from the handle and then curves outwards again at the distal end where the blade is flat with a serrated lower edge containing eleven teeth; the serrated edge forms a segment of a circle, the teeth being upon the convex edge.

(7) *Saw*.—Very similar to No. 6. An iron blade $4\frac{5}{8}$ in. long inserted in a round wooden handle about $2\frac{3}{4}$ in. long. The curves in this saw are not so sharp as in No. 6; there are thirteen teeth on its convex edge. Neither of these two saws is sharp.

(8) *Saw*.—An iron blade $2\frac{1}{4}$ in. in length with a round wooden handle $3\frac{7}{8}$ in. long. The blade for $1\frac{1}{4}$ in. from the handle is rectangular in section and about $\frac{1}{8}$ in. wide; the last $\frac{7}{8}$ in. of the blade is a flat rectangular surface with three serrated edges. The teeth are fine and sharp.

(9) *Elevator*.—A flat iron blade about $\frac{3}{16}$ in. wide projecting about $1\frac{3}{8}$ in. from a round wooden handle $2\frac{1}{2}$ in. long. The distal end curves very slightly indeed and is fairly sharp. Its corners are not rounded, but one of them has been broken off.

(10) *Weaving implement*, also used in surgery.—A sharp pointed iron blade in a round wooden handle.

(11) Fragment of bone removed from tibia.

(12) Seven fragments of bone removed from skull of a man living.

(13) Porcupine's foot worn as a charm by mothers.

(14) Dental forceps.

(15) Tin bleeding-cup.

(16) *Scalper*.—Similar to No. 1, but smaller. A cylinder of iron $\frac{5}{8}$ in. deep and $1\frac{1}{16}$ in. in diameter, a strip of iron with one sharp edge bent round till the ends meet without being joined. Where the ends meet one end is joined by fusion to an iron bar, rectangular in section, $6\frac{5}{8}$ in. long, the cylinder being at right angles to the bar. The bar is hafted into a round wooden handle.

(17) *Scalping Knife and Saw combined*.—An iron blade projecting 5 in. from a round wooden handle 3 in. long. The distal end somewhat resembles a halberd in shape; one edge, which is sharp and slightly curved, being used as a scalping knife, while the other, which is serrated with eight coarse teeth in its $\frac{7}{16}$ in. of length, forms a trepanning saw.

(18) *Saw*.—Iron blade, rectangular in section, curved to form nearly two right angles projecting from a round wooden handle 3 in. long. The distal end

is flattened to form a rectangular saw blade, $1\frac{1}{4}$ in. long and $\frac{5}{8}$ in. deep, serrated with fine teeth along its lower and distal edges.

(19) *Saw.*—Iron blade, rectangular in section, projecting 3 in. from a round wooden handle $3\frac{1}{2}$ in. long. The blade turns at right angles from its distal end and, being flattened from the turning point onwards, forms a rectangular saw blade $\frac{7}{16}$ in. long and $\frac{1}{16}$ in. deep. Its lower edge is serrated with eight coarse teeth.

(20) *Saw.*—Flat iron blade, projecting 2 in. from a round wooden handle $3\frac{1}{8}$ in. long. The blade turns at right angles at its distal end to form a slightly fan-shaped saw blade $\frac{1}{16}$ in. deep, its edge, $\frac{3}{8}$ in. long, being serrated with seven medium sized teeth.

(21) *Saw and Elevator combined.*—Flat iron blade, 3 in. long, turned nearly at right angles at the distal end, to form a slightly fan-shaped saw blade, $\frac{3}{4}$ in. deep, and having an edge $\frac{3}{8}$ in. long, serrated with five coarse teeth. No wooden handle, but the handle end is bent slightly to form a blunt elevator.

(22) *Circular Trephine.*—An iron bar, rectangular in section, and turned on its own axis once completely near the centre of its length, projecting $4\frac{1}{16}$ in. from a round wooden handle $2\frac{3}{4}$ in. long. At its distal end the blade narrows abruptly (leaving a "shoulder" on each side) and terminates in a blunt, gimlet-like spiral point, which projects $\frac{1}{8}$ in. from the "shoulders." A cylinder of iron $\frac{7}{8}$ in. deep and $\frac{11}{16}$ in. in diameter is brazed on to the bar to form the trephine, and is serrated with coarse teeth. The spiral point at the distal end of the blade is immovable, and projects very slightly beyond the serrated edge of the trephine.

(23) *Retractor.*—Iron blade, rectangular in section, projecting $3\frac{3}{4}$ in. from a round wooden handle $2\frac{3}{4}$ in. long. At its distal end the blade is flattened, and turned at right angles to form a retractor $\frac{5}{16}$ in. in width.

(24) *Elevator.*—Flat iron blade, projecting $3\frac{1}{4}$ in. from a round wood handle, $2\frac{7}{8}$ in. long. At its distal end this straight blade is sharpened, and is $\frac{3}{16}$ in. wide.

(25) *Elevator.*—A European screwdriver hafted to a rough wooden handle.

(26) Bone from the head of a boy whose case I have described in the *Journal of Royal Anthropological Institute*, xliii, July-December, 1913.

(27) Bone removed from the head of a man still living by a nomad surgeon for injuries caused by a blow from a stone.

(28) Flat square piece of lead, $1\frac{1}{16}$ in. square, with central boss perforated to receive a string for raising it; used to retain dressing after trepanning.

(29) *Probe and Seton Needle, combined.*—A straight iron rod $5\frac{5}{8}$ in. long; at one end is a knob, as in a bodkin, and an eye for the seton; at the other end the rod is flattened and slightly curved to form a probe.

(30) *Probe.*—A straight thin piece of brass wire $10\frac{1}{4}$ in. long; flattened and very slightly curved at one end.

(31) *Probe.*—A straight thin piece of wire 7 in. long sharpened to a point at one end.

(32) *Probe.*—A stout piece of iron, straight, circular in section, $7\frac{1}{16}$ in. long, one end flat and curved.

(33) *Probe.*—A straight piece of stout copper wire 8 in. long, spoon-shaped at one end and pointed at the other.

(34) *Probe.*—A flat strip of silver $3\frac{1}{4}$ in. long pointed at one end and spoon-shaped at the other.

(35) *Probe.*—Similar to No. 34, but $2\frac{3}{4}$ in. long and ornamented with three pairs of transverse incised lines.

(36) *Limb Saw.*—Iron bar, rectangular in section, 8 in. long, flattened for $5\frac{1}{4}$ in. at the distal end to form the saw blade. Of this blade $3\frac{1}{4}$ in. at the distal end are serrated with medium teeth. There is no wooden handle.

(37) *Probe.*—A straight piece of brass wire with blunt ends: one end turned over twice to form a loop: length $6\frac{1}{4}$ in.

(38) *Trident Bone Drill.*—Flat iron blade rectangular in section and twisted to form a spiral projecting $4\frac{1}{2}$ in. from a round wooden handle $3\frac{1}{4}$ in. long. The distal end is slightly fan shaped with three very coarse pointed teeth.

(39) *Tweezers.*—Two pieces of flat iron welded together at one end, the distal ends slightly curved towards each other. Length $2\frac{1}{4}$ in.

(40) *Eyelid Hook.*—A flat strip of copper tapering to a very sharp point at one end where the point is turned back to form the hook. At the other end the strip is turned over to form a loop for suspension. Length $2\frac{1}{2}$ in.

(41) *Eyelid Hook.*—Similar to No. 40 but 2 in. long.

(42) *Eyelid Splint.*—A straight piece of bamboo $1\frac{3}{4}$ in. long, notched at each end, and bound with cotton at one end; the bamboo is split from the other end nearly up to the cotton binding. There is a long free end to the cotton for use in binding the other notch when the splint is in position.

(43) Bone and bullets removed from man's tibia by nomad surgeon.

(44) *Shawia Splints for Tibia.*—The two side splints are 15 in. by $1\frac{7}{8}$ in. and $14\frac{3}{4}$ in. by $2\frac{1}{4}$ in. respectively; the front splint 12 in. by 1 in.; and the back splint $15\frac{1}{8}$ in. at its greatest length. They are made of hard wood and have been carved with an adze to curve slightly to fit the limb.

(45) *Cautery Instrument.*—Iron blade circular in section projecting $8\frac{1}{2}$ in. from a round wooden handle $2\frac{3}{4}$ in. long. At $1\frac{1}{2}$ in. from the distal end the blade is turned nearly at right angles. The distal end is blunt.

(46) *Cautery Instrument.*—Iron blade rectangular in section projecting 9 in. from a round wooden handle $3\frac{1}{2}$ in. long. At distal end the iron is flattened to form a knife-like blade and is turned down at an angle of about 30°.

(47) *Cautery Instrument.*—Iron blade nearly rectangular in section projecting about $6\frac{1}{2}$ in. from a round wooden handle about $4\frac{1}{4}$ in. long. The distal end is turned at right angles and is flattened to form a pointed blade with a fairly sharp curved outer edge; either this curved edge or the point are used to give cautery.

(48) *Cautery Instrument.*—Similar to No. 46 but the knife-like blade is small. The blade projects $7\frac{1}{2}$ in. from a round wooden handle 4 in. long.

(49) *Cautery Instrument.*—Iron blade, rectangular in section where it joins the handle, but round for the rest of its length, projecting $5\frac{1}{2}$ in. from a round wooden handle, much damaged by charring. The blade is turned to form a right angle at the distal end which is sharp pointed.

(50) *Cautery Instrument.*—Similar to No. 49. Blade projects $5\frac{1}{2}$ in. from a new round wooden handle $4\frac{3}{4}$ in. long.

(51) *Cautery Instrument.*—Flat iron blade projecting 4 in. from a new round wooden handle $2\frac{1}{8}$ in. long. The distal end is further flattened to form a rectangular blade 1 in. long and $\frac{3}{4}$ in. wide with fairly sharp edges. The cautery is applied with the distal end.

(52) *Cautery Instrument.*—Similar to No. 49. The blade projects $4\frac{1}{2}$ in. from a round wooden handle 3 in. long.

(53) *Abscess Lancet.*—A flat strip of brass, square at the distal end and curled over twice at the handle end to form loop for suspension. Length $5\frac{7}{8}$ in.

(54) *Abscess Lancet.*—Straight iron blade $8\frac{3}{8}$ in. long, rectangular in section for $1\frac{3}{4}$ in. at the handle end, after which it is circular in section and tapers to coarse point at the distal end. No wooden handle.

(55) *Abscess Lancet.*—Iron blade projecting $7\frac{1}{8}$ in. from a round wooden handle $4\frac{1}{8}$ in. long. The blade is rectangular in section where it joins the handle, after which it is circular in section and tapers to a point. The distal end is curved.

(56) Instrument resembling the weaving instrument No. 10, used to make the perforation for a "seton." The blade which is flat where it joins the handle but circular in section and tapering to a point at the distal end, projects $2\frac{7}{16}$ in. from a well made round wooden handle 3 in. long into which it is socketed through a collar of brass.

(57) *Seton-needle.*—A rod of copper $3\frac{5}{16}$ in. long, blunt at the distal end, flattened and gouge shaped at the other end where it is perforated with an "eye."

(58) *Dental Forceps.*—$7\frac{3}{4}$ in. long. Two coarse teeth on each jaw, handles corrugated to assist the grip and one handle bent up for the same purpose.

(59) *Dental Forceps.*—Similar to No. 58 but $6\frac{1}{2}$ in. long; three teeth on each jaw, and plain handles, one bent up.

(60) *Dental Extracting Hook.*—Iron blade rectangular in section, projecting $3\frac{1}{2}$ in. from a round wooden handle $3\frac{1}{4}$ in. long into which it is socketed through a flat iron disk. The blade tapers to a coarse point at the distal end where it is turned to rather more than a right angle to form a hook.

Section of the History of Medicine.

President—Sir D'Arcy Power, K.B.E., F.R.C.S.

A Twenty Minutes' Talk on "The Fees of our Predecessors."[1]

By Sir D'Arcy Power, K.B.E., F.R.C.S.

Of medical fees I think we may say with Koheleth, "that gentle cynic," as Professor Jastrow calls him, "the thing which hath been is that which shall be; and that which is done, is that which shall be done; and there is no new thing under the Sun. Is there anything whereof it may be said, See, this is new? It hath been already of old time which was before us."

The earliest record of which I know is in connexion with surgery at a time when physicians were mostly churchmen and presumably did not charge for their advice. It is a surgical fee of about the year 1350 and is given in the following words: "Ask ye boldly, more or less, but ever be wary of scarce asking. For the cure of a fistula, when it is curable, ask competently of a worthy man and a great, an hundred marks or £40 with robes and fees of an hundred shillings for the term of life by the year. Of less men, £40 or 40 marks ask ye and take ye not less than an hundred shillings for never in all my life took I less than an hundred shillings for the cure of that sickness. Nevertheless, do another man as he thinketh best."

This gives you the way in which fees were paid in the fourteenth century, a certain sum of money down, a livery, or suit of clothes and an annuity paid yearly so long as the patient lived. The surgeon therefore was well paid, for we know that money at that time was probably seventeen times more valuable than the pre-war sovereign. This particular surgeon had several patients who, as we know from the Peerage,

[1] At a Social Evening of the Royal Society of Medicine, held January 30, 1920.

lived many years after he had operated upon them. What he did with his money I cannot discover, though I have been writing to some friends in Cambridge to ascertain what was the custom in those days. He would not, I think, lend more than he could help to the King, because he was notoriously a bad payer; he did not buy land, for I have looked through many records, and if he had become a landed proprietor some record of it must remain. There were of course no funds nor companies. I suspect that he lent money on a rent charge to Knights and Barons who were going out to take part in the Hundred Years War.

The custom of giving an annuity after a successful operation survived for a long time. As late as 1660 Richard Wiseman says in one of his treatises: "A patient came to me upon whom I had operated and who had been away in the country about two years. He then returned to London and acknowledged to me his cure by settling £30 a year upon me during his life and paid me £60 for the two years past."

Readers of French history know that Louis XIV paid Dr. François Félix the sum of £150 and settled a farm upon him in 1686 for curing him of a fistula. The livery or suit of clothes also lingered (as we shall see presently) for a long time.

The actual fee paid under ordinary conditions was reckoned in marks, though a mark was merely a sum of money equal to 13s. 4d., and not an actual coin. When money passed it was paid in nobles, a coin worth from 6s. 8d. to 10s., and in later times by an angel. I have one here if you care to come and look at it presently. You will see the angel from which it obtained its name stamped on the reverse. This particular angel has had a hole drilled through it, and is smaller than the ordinary angel. It was slung round the neck and was given by the King, after he had touched a person for scrofulous glands.

In 1660 a new coin came into existence, which was called a guinea. Thanks to Sir John MacAlister I am able to show you two guineas—one, the earlier, with royal arms upon the reverse; the other, the later, with the arms in a shield and therefore known as a spade. The value of the guinea varied from 21s. 6d. to 30s. or even 35s., its lowest and most uniform value being apparently 21s. 6d. It seems, therefore, that the standard fee was always the gold coin of the period, though the general practitioner had of course to be contented with much smaller sums.

A new system had arisen during the later Tudor period in England, for a surgeon then contracted to cure his patient—a very

unsafe thing to do. If a cure were not effected the fee had to be returned. There are many records in the Barber Surgeons' Company of patients complaining that they have not been cured; these complaints were made against surgeons from the highest to the lowest—thus Clowes, Serjeant-surgeon to Queen Elizabeth, had contracted to cure Goodnep's wife de morbo gallico for 20s., but did not do so. The patient's husband complained, and it was awarded that the woman should either be cured or the fee returned. Clowes, like a wise man, said he would rather give back the fee: he gave it back, the parties shook hands, and the matter ended. In like manner the humblest little barber-surgeon, who was doing general practice, in a very small way, was often complained of for not curing his patients. We learn from the records that he contracted on a different system, for he would take a small sum of money down and would receive a gown or something else in pledge for the remainder. If he did not cure the patient, or if the patient died, the friends were apt to complain, and he then had to return the fee or give back what he had taken in pawn. I think this method of taking fees, partly in money and partly in kind, existed more extensively in the country than in London. There was always a certain amount of ready money available in London, but in the country many of the accounts were settled by exchange. I have here a very interesting record sent to me by Dr. Edward J. Cross, of St. Neot's, Hunts. It is the ledger of his firm between the years 1740 and 1750. It shows in detail the bills which were sent to the patients by his predecessors in the practice. It proves that the accounts were hardly ever paid in full and at once, and they were mostly small. Here for instance is an account for £7 10s., and a record of several small settlements, with an occasional item such as six ducks for 4s. 6d. as a set off. "Sweating, 1s.; bleeding, 1s.; plaster, 6d.; for linctus, 2s.; tincture to apply to the ribs, 1s."; in the end the total of this bill is 16s. Another amounts to 8s. A fairly good thing was made out of journeys—iter as each is called—2s. 6d. to 4s. 6d. for different people in the same neighbourhood, but the doctor appears to have gone only when it was really necessary, for several days often elapsed between successive visits. The whole book is very interesting, and I wish people would not throw away their old ledgers, as is too often done, in long established practices.

What I have been saying shows you one extreme; the other is where people have received very large fees; there is the record, for instance, of Dr. Dimsdale, who went over to Russia and inoculated the Empress

Catherine and many of the nobility against small-pox. For that service he is said to have received £10,000 and an annuity of £500 a year and the rank of Baron. I asked the Dowager Lady Dimsdale about this fee, as she has access to Baron Dimsdale's diary. She very kindly referred to it, and says that she cannot find any mention of the £10,000 fee, though he speaks of the annuity.

Sir Peter Freyer is good enough to allow me to mention the fee which he received, although he is not to be counted amongst our predecessors for he is fortunately living in good health amongst us. Here is the Arabic tablet which was presented to him on August 5, 1888, the translation runs: "His Highness the Nawab, Mohamad Mushtag Ali Khan Bahadur, of Rampur in Kohil Khund, presented in Public Durbar two notes amounting to Rs. 100,000 (1 lakh) to Dr. P. J. Freyer, Civil Surgeon, Moradabad, an Officer of the British Government, for the treatment and recovery of His Highness and of General Mohamed Azim Uddin Khan Bahadur, Vice-president of the Council of His Highness."

This amounts to £12,000, and is, I think, a princely and perhaps a record fee. I told you just now that people were paid in kind to a large extent. This custom still survives amongst us to this day. I have brought down for you to see a very interesting loving-cup, which was presented to Surgeon-General Guthrie at the end of the Peninsular War by members of every branch of the medical service. It was given to my father in place of a fee by Miss Guthrie, his daughter. I also show you a gold snuff box of the finest French period, which was left to me by the will of a patient who had been operated upon several years before in St. Bartholomew's Hospital. I was only the dresser, and I thought it should have gone to the surgeon, but she decreed otherwise. The custom is a pleasant one, and is far more valuable than any money payment as a recognition of one's services.

Our predecessors earned much larger fees than the present generation. Men like Sir Astley Cooper gained £10,000 to £25,000 a year, partly by long journeys and partly by numerous consultations in his own house. Abernethy in like manner got a great deal of money in that way: his consulting-room was always crowded; operations were few; surgery in the provinces was not so developed as it is in the present day, and all wealthy patients and serious cases necessarily gravitated to London. I think, therefore, that we are not paid in anything like the same proportion as our predecessors were paid. Money, even a hundred years ago, had a much greater purchasing power than it has at present,

and if we go back as far as the fourteenth century where I began, we find that England was a wealthy country, and the hours of labour were probably not more than eight a day, for the labourer had time to cultivate his own land. On the other hand, there were many drawbacks attending practice at an early time. A surgeon could not undertake more than two or three cases in a year, for he was expected to live in the house of his patient after an operation until the wound was healed, and as all wounds suppurated and the patient lived in a castle or moated house with insanitary surroundings, this was often a lengthy process. There were of course surgeons—sons of Belial—who took the fee beforehand, operated and fled the same day, but such persons were not looked upon as ornaments to their profession, though they often escaped punishment for long periods at a time when roads were bad and there was no speedy communication between one county and another. I could tell you much more about fees, but my twenty minutes have expired.

DISCUSSION.

The PRESIDENT of the Society (Sir HUMPHRY ROLLESTON): Sir D'Arcy Power has left off in a tantalizing manner, because we all wanted to hear a great deal more. From what he has said I rather gather that fees mainly concern surgeons, but on this question I should like to call into consultation Sir George Makins, Sir Peter Freyer, Dr. Nathan Raw, and Sir William Hale White.

Sir GEORGE MAKINS: I am not really in a position to say very much about large fees. I agree that the fee at the present day is apparently quite inadequate compared with what we have learned surgeons used to receive in old times. I am not sure that I very much regret the change in ceasing to receive an annuity which only ended with the patient's life. It might have been an inducement to keep a patient alive, but it must have been uncomfortable in a surgeon's later days to have his income fluctuating with the life or death of patients. It seems to me that Sir D'Arcy Power has tapped a somewhat new source to-night, and, considering how much we have received from him in the past, we shall look forward to having a good deal more information on this subject in the future. It certainly is a source which is worth investigating, and information might be useful even from the political point of view at the present moment. While I am standing I would like to say how much the profession is indebted to Sir D'Arcy Power for the large amount of antiquarian work he has done. He has not only given us ancient history, but he has the great merit of having brought history practically up to the present time. To many of us the articles which he has been publishing of late concerning surgeons during the last century

and a half are of more interest than the histories of more ancient people. I am pleased to have the opportunity of expressing our gratitude to Sir D'Arcy Power for the pleasant twenty minutes he has given us.

Sir PETER FREYER: I have much pleasure in seconding the vote of thanks which has been proposed in such graceful terms by Sir George Makins for the manner in which Sir D'Arcy Power has delivered his most interesting lecture this evening. I observe the title of the address was, "The Fees of Ancestors." Whose ancestors? As one of them I must apologize for appearing before you this evening, by the kind intervention of Sir Conan Doyle, having put off my ethereal for my terrestrial form. Perhaps I may refer to a much greater fee than any which have been alluded to this evening, one which was received by one of my fellow shades, the celebrated Dr. Gabriel Boughton. I know he would wish to be here this evening—that he has made many a struggle to get here; and if by any chance you hear any of those mysterious sounds which accompany the transmission from the ethereal to the terrestrial world, you may be sure it will be the bagpipes, as he happened to be a Scotsman. Dr. Gabriel Boughton was a fellow officer of mine in the Indian Medical Service. That service goes back to the closing year of the sixteenth century, when Queen Elizabeth granted a Charter to her hardy Englishmen who penetrated into the various quarters of the globe, particularly to India. And I am glad to see that members of our profession braved the dangers of the Atlantic and Indian oceans to comfort these hardy traders. Gabriel Boughton was one of the earliest of these doctors, and in the year 1638 he cured the daughter of the Emperor Shah Jehan of Delhi. Two years later he cured the wife of his son, Shaw Shulds, Regent of Bengal. For these services he was granted a tract of land, on which Calcutta now stands. And history relates that such was the unselfishness of this doctor that he actually handed over this tract of land as a free gift to the East India Company. You will notice what a falling off there has been in the moral tone of the Indian Medical Service since those days, for, as Sir D'Arcy Power relates, an officer, who now appears in his terrestrial form, having had the good fortune to shake the Pagoda tree, with the result that a lakh of rupees tumbled into his lap, selfishly, instead of giving it to the Government, had this ripe, luscious and sustaining fruit placed to his credit at the Bank of Bengal. I myself have often thought on the act of Gabriel Boughton, and I have come to the conclusion that he made a virtue of necessity, and that his handing over of this tract of land to the Government was entirely due to the fact that in those days no Bank of Bengal existed in which the title deeds could be safely placed; and I am confirmed in this opinion by the fact that he hailed from north of the Tweed.

Dr. NATHAN RAW, C.M.G., M.P.: I have very great pleasure in seconding this resolution of thanks to Sir D'Arcy Power for his charming and interesting lecture. I think it must always be the case that the heads of all the great professions must necessarily demand very large and handsome fees; but I

think, when we consider the very large amount of gratuitous work which is given to our fellows by the medical profession generally, I do not think any of us believe for one moment that the large fees which do occasionally come are by any means anything less than are thoroughly deserved. The great question of money, which Sir D'Arcy Power has referred to to-night, is undergoing a very extraordinary change. Money is being transferred from one class to another class, with the result that a very large number of people are not able to pay the fees which they willingly would to the medical profession, and I sincerely hope that the fees which are paid at the moment will be very much increased, especially to those members of our profession who have to attend the industrial classes in this country. I have the very greatest pleasure in supporting this resolution.

Sir WILLIAM HALE WHITE: I have very little to say, sir: I know nothing about the subject. While I was listening to Sir D'Arcy Power I was reminded that we must be quite sure about the fees of our ancestors. For instance, there is a possible fallacy as to Sir Astley Cooper's income: for I remember that this was said by the jealous of his time. You will recollect that he had a butler who was extraordinarily like him in appearance. Sir Astley also, as Sir D'Arcy Power will bear me out, was a most enthusiastic surgeon and anatomist, and he never was late for his appointment at the hospital. Accordingly, when the time for ceasing seeing these crowds of surgical patients, to whom reference has been made, came, he slipped out by a back door and across a yard, where his carriage was awaiting him, and drove off to the hospital, always turning up punctually. And the wicked said his butler slipped into the consulting room and went on seeing the patients. There was only one other tale which came into my head while I was listening to the address: I will not give the name of the doctor, because it is possible there may be a descendant of him here. It is said that a physician flourished about the year 1850, having a large practice, and many other physicians were jealous of him. And it was said that the conductor of an omnibus that passed the door of the physician received an income from the physician on the understanding that when the 'bus passed the door he always put his head inside and said, "Any patients this morning for Dr. So-and-so?"

(The resolution was passed by acclamation.)